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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/663,585 | 09/16/2003 | Robert A. Hendel | 020354 071P2 | 3291 |

33805 7590 02/09/2007

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| EXAMINER | |
|---|---|
| DRODGE, JOSEPH W | |
| **ART UNIT** | **PAPER NUMBER** |
| 1723 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 02/09/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/663,585 | HENDEL ET AL. | |
| | Examiner | Art Unit | |
| | Joseph W. Drodge | 1723 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *12 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *2,3,7,8 and 12-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2,3,7,8 and 12-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2,3,7,12 and 14 are rejected under 35 U.S.C. 102(b) as anticipated by Chen et al patent 6,444,747 or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chen et al patent 6,444,747 in view of McNeel et al patent 6,180,056.

Chen et al generally disclose the instantly claimed co-polymer (Abstract) used for inhibiting scale and corrosion of surfaces, including reverse osmosis and microfiltration membranes (column 5, lines 34-63), the co-polymer being dissolved into the aqueous carrier medium that will contact the membrane (column 4, lines 14-21). Inhibition of specifically calcium phosphate scale or precipitate is disclosed at Chen column 5, lines 35-37 and also column 4, lines 34-35. Concentrations of copolymer are disclosed in column 4,lines 16-18 for claims 2 and 3. For claim 7, adding the polymers directly into the water system being treated (column 4, lines 19-21) infers membrane immersion. For claims 9 and 10, scales such as calcium phosphate are inhibited (column 5, lines 36-37). For claim 12, use of AA/APES monomer blends is shown in the Table bridging columns 8 and 9. ***The disclosed inhibiting of scale and corrosion of surfaces of Chen et al equates to preventing calcium phosphate precipitation from adversely affecting throughput of aqueous solutions passed through the membrane. Maintaining or even improving salt rejection of the membrane is an inherent property of use of the co-polymer AA/APES and of other polymers and co-***

***polymers disclosed by Chen and it's discovery does not equate to a patentable distinction.***

> "[T]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer." *Atlas Powder Co. v. Ireco Inc.*, 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999). Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). >In *In re Crish*, 393 F.3d 1253, 1258, 73 USPQ2d 1364, 1368 (Fed. Cir. 2004), the court held that the claimed promoter sequence obtained by

The claims may optionally be considered to differ in explicitly requiring that the membrane treatment not adversely affect either salt rejection of the membranes treated or throughput of aqueous solution or dispersion therethrough. However, McNeel et al teach treating reverse osmosis membranes with acrylic acid polymers, combinations of polymers and derivatives (column 3, line 63-column 4, line 26 with polyacrylic acids being named at column 4, line 5) and properties of the membrane-treating chemicals being effective in eliminating membrane fouling without adversely affecting either permeate flow or salt rejection (column 3, lines 25-34). Inhibition of scale of types including compounds of calcium and phosphate is strongly suggested at column 4, lines 54-56 and the Table at column 7. It would have been obvious to one of ordinary skill in the art at the time of the invention to have practiced the membrane cleaning or treatment method of Chen in such manner so as to have no adverse effect on salt rejection of membrane or flow through the membrane or even allow an increase in salt rejection, since McNeel teaches that such effects are inherent properties of cleaning or treatment of membranes using acrylic acid-containing formulations.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al , or Chen et al in view of McNeel and further in view of Amjad patent 4,895,658. Claim 8 differs in requiring the membrane treated to be polyamide RO membranes. It would have been obvious to one of ordinary skill in the art to have applied the method of Chen et al to polyamide RO membranes, since Amjad teaches at column 1, lines 9-11, 40-43) use of polyamide membranes, and effective inhibition of calcium-containing scale from their surfaces by use of cleaning formulae that include acrylic acid (column 4, lines 56-59 and column 5, lines 19-37).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al or Chen et al in view of McNeel and further in view of Kessler et al patent 6,099,755. Claim 13 differs in requiring the treatment agent to be AA/PEGAE formula. However, Chen et al disclose related AA/APES cleaning composition and it would have been obvious to have substituted the AA/PEGAE formula taught by Kessler et al at column 6, lines 39-53, since such formula has proven effective in inhibiting calcium phosphate scale under dynamic testing.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al , or Chen et al in view of McNeel et al, and further in view of Takiguchi et al PGPUBS Document US2003/0008793.

Claim 15 differs in requiring AA to be combined with an allyloxy-propanediol polymer. However, Takiguchi teaches such polymer or its derivative used in a cleaning composition (paragraph 140) and co-polymers of such compositions with acrylic acid polymers (paragraph 27) and their use in cleaning any hard or fabric surface (paragraph 1). It would have been further obvious to one of ordinary skill in the art to have combined the AA membrane treatment and cleaning polymer of Chen with the allyloxy-propanediol polymer of Takiguchi, since Chen discloses AA being especially effective when combined with a co-polymer and Takiguchi teaches the propanediol polymer having effectve detergent properties while being highly soluble in water (such as the water being passed through the membrane filter).

The Rule 132 Affadavit submitted January 12, 2007 , including the Archived data, have been reviewed and are found to be not persuasive regarding patentability of the

claims. Although the experimental results of using an AA/APES co-polymer in treating membranes to not only prevent degradation in membrane performance due to scaling but also actual increase in salt rejection are seen to be impressive, they are not deemed persuasive regarding patentability. Discovery of a new property of an old formulation used in an identical manner in the prior art does not constitute patentability.

The gradual increase in salt rejection corresponding with a gradual decrease in normalized flow, over time, when applying the co-polymer to the membrane inherently reflects a gradual adsorption or absorption by membrane surfaces of the co-polymer, not merely a different mechanism of function of the claimed co-polymers with respect to that of other co-polymers or polymers.

In view of the foregoing, when all of the evidence is considered, the totality of the rebuttal evidence of nonobviousness fails to outweigh the evidence of obviousness.

Applicant's arguments filed on January 12, 2007 have been fully considered but they are not persuasive. It is argued that Chen does not explicitly state or even suggest functionality of applying treating copolymer without adversely affecting, or even improving, salt rejection and throughput through the membrane. However, such functions are an inherent property of a known formulation known to treat membranes for preventing scaling and preventing degraedation of performance. If necessary, these properties are explicitly stated by McNeel where membranes are cleaned with similar acrylic acid polymers and mixtures of such polymers to those applied by Chen.

It is argued that McNeel does not refer to an allyloxyl functional copolymer inhibiting scale. However, Chen discloses such specific copolymer being used for inhibiting scale formation on membranes, while McNeel teaches that similar that similar antiscalants such as mixtures of similar antiscalants such as polyacrylic acid and phosphonate compounds inhibit scaling including molecules of colloidal calcium and phosphate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Drodge at telephone number 571-272-1140. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda Walker, can reached at 571-272-1151. The fax phone number for the examining group where this application is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either private PAIR or Public PAIR, and through Private PAIR only for unpublished applications. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JWD

February 7, 2007

JOSEPH DRODGE
PRIMARY EXAMINER